SECTION  – signage

GENERAL

* 1. SUMMARY
     1. Description of all materials, fabrication standards, and installation services for the sign system.
     2. Scope of work includes but is not limited to the following:
        1. Interior overhead and wall mounted signs attached to in-place sub-surface anchors and blocking provided by others. Verify sub-surface anchor locations on site.
        2. Interior sign panels with electronic displays. Coordinate fabrication and installation to ensure compatibility of sign cabinet with electronic display and with recessed wall areas for each sign location. Verify size and condition of recessed areas on site.
        3. Interior signs applied to various substrates with adhesives, mechanical fasteners or both as required by weight, surface materials, moisture conditions, and durability considerations.
        4. Exterior signs with permanent foundations, including site preparation and restoration in the immediate work areas.
        5. Exterior signs coordinated with and attached to architectural elements and other features specified by others.
        6. Roadside regulatory signs placed according to direction of applicable federal and state departments of transportation and other authorities having jurisdiction at the site.
        7. Exterior signs mounted to the face of existing structures at varied heights above finish grade. Work to be coordinated with the project construction sequence, project schedule and other trades as directed.
  2. general requirements
     1. Substitutions: Comply with section 01 25 13 – Product Substitution Procedures.
     2. Approvals: All submittals and articles of any kind necessary for the work are subject to approval by Consultant and Owner.
     3. Coordination: Coordinate the work of all trades as required for the installation of all signage, including structural support and electrical requirements. Coordinate final sign placement on-site with the Consultant and the Owner prior to final installation. Patch and repair all damage resulting from the work.
     4. Sign Definitions, Descriptions and Characteristics: Message Schedule and Sign Location Plans for precise definition and proposed message of each sign.
     5. Time of Completion: Sign Fabricator shall complete all work in accordance with schedule milestones. All activities shall be sequenced to coordinate with field progress.
     6. Pre-Construction Conference: A pre-construction meeting will be held with representatives from Owner, Sign Fabricator and Consultant to establish the procedure for communication and coordination with the General Contractor or Construction Manager and subsequent trades.
     7. Field Measurements: Measure in-place any existing construction as needed for fabrication and execution. No changes to fees or schedule will be allowed for differences between Design Intent dimensions and field measurements.
     8. Electrical Service: Requirements shall be determined as soon as possible. Electrical service must be coordinated with service available at each sign location. Service may vary according to location. Only new electrical components and respective lamps shall be utilized. Reasonable access for maintenance components and lamps is required.
     9. Instruction: Prior to acceptance, establish with Owner an instruction and training program for Owner personnel. Notify Owner in writing at least seven (7) days prior to commencement of the program by providing an outline of topics indexed to the Maintenance and Operating Manual. Provide a trained instructor. Instruction and training shall include, but are not limited to, procedures to be followed in the normal day-to-day maintenance and operation of the work.
     10. Permits: Contractor and Sign Fabricator shall make all submittals for permits; shall be responsible for paying all fees, making adjustments as required, or any task necessary for obtaining local building and installation permits for the proper execution of the work. All such permits must be obtained prior to fabrication of the sign item. Copies of all permits shall be delivered to the Owner. Where permitting authorities require the submission of documents signed and sealed by the responsible engineer, ensure scheduling of sufficient time for Consultant submittal reviews in advance of the prospective permit submission date.
     11. Markings and Labels: Visible labels are not allowed except as required. When necessary, locate markings, labels, manufacturer names and other identifications so as to be concealed from public view.
     12. Final Location of Signs: The location of signs as shown on the Sign Location Plans is for general reference only and in some cases is not representative of the exact final location. Final locations of signs shall be field located in coordination with Consultant and Owner at the site. Sign Fabricator shall arrange for meetings at the site to accommodate direction of final locations according to project schedule.
     13. Discrepancies: Any discrepancies in the drawings or graphic message schedule, in field dimensions or conditions and/or changes required in construction details shall be resolved by Consultant. Sign Fabricator shall advise Consultant as these conditions are discovered. Sign Fabricator shall not resolve these issues independently.
     14. Rights to Design: Sign Fabricator may not manufacture, reproduce, or exhibit these designs, or modify them for any other purpose outside of this current contract without written approval of Owner.
     15. Structural Documents: Submit for review final installation drawings for structural components, signed and sealed by an engineer responsible for the work and licensed to practice in the applicable jurisdiction.
  3. REFERENCE STANDARDS
     1. Aluminium Association (AA)
        1. AA DAF 45-[03(R2009)], Designation System for Aluminum Finishes.
     2. ASTM International
        1. ASTM A 123/A 123M- [13], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
        2. ASTM A 653/A 653M- [13], Standard Specification for Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
        3. ASTM B 32- [08], Standard Specification for Solder Metal.
        4. ASTM B 456-[11e1], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
     3. Canadian General Standards Board (CGSB)
        1. CGSB 31-GP-107Ma- [90], Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
        2. CGSB 41-GP-6M- [1983], Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.
     4. CSA Group (CSA)
        1. CSA W47.2- [11], Certification of Companies for Fusion Welding of Aluminum.
        2. CSA W59- [13], Welded Steel Construction (Metal Arc Welding).
        3. CSA W59.2-[M1991(R2013)], Welded Aluminum Construction.
     5. Canadian Sheet Steel Building Institute (CSSBI)
        1. CSSBI SSF 6- [2012], Sheet Steel Facts #6, Metallic Coated Sheet Steel for Structural Building Products.
     6. Green Seal (GS)
        1. GS-11- [2013], Standard for Paints and Coatings.
        2. GS-36- [2013], Adhesives for Commercial Use.
     7. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
        1. Safety Data Sheets (SDS).
     8. South Coast Air Quality Management District (SCAQMD)
        1. SCAQMD Rule 1113- [13], Architectural Coatings.
        2. SCAQMD Rule 1168-[A2011], Adhesive and Sealant Applications.
     9. Master Painters Institute (MPI)
        1. Architectural Painting Specification Manual - [current edition].

MPI #76, Quick Dry Alkyd Metal Primer.

MPI #96, Quick Dry Enamel Gloss.

* 1. SUBMITTALS
     1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
     2. Product Data:
        1. Submit manufacturer's instructions, printed product literature and data sheets for signage and include product characteristics, performance criteria, physical size, finish, and limitations.
     3. Shop Drawings:
        1. Submit drawings stamped and signed by professional engineer registered or licensed in the place of work.
        2. Submit catalogue sheets and full-size templates.
        3. Furnish plans, elevations, sections, and details of fabrication and erection for all items outlined in Design Intent Documents. Include all materials, shapes, dimensions, finishes, mounting heights, method of anchoring and connections, and mounting methods. Provide notations for reinforcement, structural members, supports, surfaces, finishes, materials, and accessories.
        4. Submit full size templates for individually fabricated lettering indicating word and letter spacing.
        5. Full or ½ scale artwork for pictographs used in Transport Canada Buildings will be provided.
     4. Sign Layouts: Provide full-scale layouts for each sign type including text, symbol artwork, Type 2 Braille, and any other graphic elements as solid black with sign face outlined. Provide scaled layouts for all signs. All Sign Layouts should indicate the following: complete layout including proper character spacing and heights; dimensions of all layout elements relative to the sign panel and to one another and exact typeface and letterspacing.
     5. Electrical: Provide wiring diagrams and electrical load requirements for signs with illuminated characters, panels, or faces.
     6. Schedule: Submit a project schedule that conforms to project occupation and opening dates. Include submittals, review, production milestones, shipping, on-site preparation, installation, and follow-up.
     7. Samples:
        1. Submit duplicate representative sample of each type of sign, sign image and mounting method including, but not limited to: graphics, cast letters, sign box installation method, channel letters, and wall plates fixed mounting installation method.
     8. Extra Materials: Deliver to Owner, in manufacturer's original packaging and store at the project site where directed: one (1) gallon of each finish paint color for touch-up purposes; six (6) lamps of each type/model and size used; one (1) cooling fan of each type/model and size used; and one (1) ballast of each type/model and size used. Provide paint formula index for every color used. Provide packaging and protection for extended storage. Deliver to the owner, all molds or forms used to produce signs.
     9. Supplementary Product Literature: Submit manufacturer's literature describing the general properties of each product to be used.
     10. "Excessive Fading": A change in appearance, which is perceptible and objectionable as determined when visually, compared with the original color range standards.
     11. "Excessive Non-Uniformity": Non-uniform fading to the extent that adjacent panels have a color difference greater than the original acceptable range of color.
     12. "Will Not Pit or Otherwise Corrode": No pitting or other type of corrosion, discernible from a distance of 10' (3m), resulting from the natural elements in the atmosphere at the project site.
     13. Maintenance and Operating Manuals:
         1. Provide required information in accordance with Section 01 78 36 - Warranties.
         2. Furnish complete manuals describing the materials, devices, and procedures to be followed in operating, cleaning, and maintaining the work. Include manufacturers' brochures and parts lists describing the actual materials used in the work, including metal alloys, finishes, electrical components, and other major components. Include in the manual samples of all vinyls or films used, samples of all paints used, and all paint formulas used. Assemble manuals for component parts into single binders identified for each system.
  2. QUALITY ASSURANCE
     1. Mock-ups and Prototypes: Provide a mock-up (partial for large signs; complete for smaller signs) of all sign types. Utilize the same materials and installation methods in the mock-up as intended for the final work. Schedule the installation so that the mock-up may be examined, and any necessary adjustments made, prior to commencing fabrication of the final work. Replace unsatisfactory items as directed. When accepted, mock-up shall serve as the standard for materials, workmanship, and appearance for such work throughout the project. Approved samples will not be returned for installation into project.
     2. Work-In-Progress Approvals: Scheduled or unscheduled viewings at the shop or factory may be initiated as deemed necessary to ensure continued quality control and make any adjustments required during fabrication. Unsatisfactory items are to be corrected by the Sign Fabricator as directed. All subcontractors shall be identified; contact names, numbers and addresses shall be provided with reference to sign types they will be fabricating.
     3. Source Limitations: Obtain each material type, shape or size from one source from a single manufacturer.
     4. Materials: Cut all required faces, trim, or continuous surfaces from a single piece of base material unless overall size cannot be obtained from a single piece due only to its size. Materials shall be new, un-used in any previous work, free of imperfections of surface, substance, manufacture, or damage from shipping or handling. Materials shall be utilized in the fabrication process only for the purpose intended by the original manufacturer or supplier.
     5. Welding Certification in accordance with CSA W47.2.
  3. Regulatory Requirements
     1. Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State and Municipal authorities having jurisdiction, include state and federal ADA requirements as applicable. Obtain necessary approvals and permits from all such authorities as required.
     2. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
        1. Fire Doors: Fire Marshal, Province of Ontario, Canada.
        2. Room Capacity: Fire Marshal, Province of Ontario, Canada.
        3. Elevator Signs: Building Department, Province of Ontario, Canada.
        4. Stairway Identification: Fire Marshal, Province of Ontario, Canada.
        5. Live Load Capacity: Fire Marshal, Province of Ontario, Canada.
        6. Signs for Accessible Spaces: Building Department, Province of Ontario, Canada.
        7. Electrical signs: ULC Listed components as required.
        8. Pool information: Province of Ontario, Canada Health Department
  4. Quality Of Workmanship
     1. Sign Fabricator: The Sign Fabricator shall be responsible for the quality of all materials and workmanship required for the execution of this contract including materials and workmanship of any firm or individual who act as Sign Fabricator's sub-contractor. Sign Fabricator shall be responsible for providing up-to-date drawings, specifications, graphic schedule, etc., to all sub-contractors. Sign Fabricator shall provide a supervisor who will be assigned for the duration of the project.
     2. Installer Qualifications: Installer shall provide workers trained and supervised by signage manufacturer. An authorized representative from the Sign Fabricator shall be present for the duration of the on-site installation.
     3. Fabrication Qualifications: Fabrication and installation shall be conducted by trained individuals working under the direct and continual supervision of the Sign Fabricator or sub-contractors as disclosed on the bid form. All materials shall remain under the direct control of the Sign Fabricator or his disclosed sub-contractors during the entire fabrication and installation process.
     4. Templates: Templates will be required for certain sign items noted on design drawings. Templates must be created only after complete installation of finish surfaces to receive installed sign.
     5. Sign Locations: Sign locations shall accommodate full door swing where applicable, in addition to required mounting height and position requirements.
     6. Dimension: Written dimensions on drawings shall have precedence over scaled dimensions. Sign Fabricator shall verify and be responsible for all dimensions and conditions shown by these drawings. Shop details must be approved prior to fabrication.
  5. DELIVERY, STORAGE AND HANDLING
     1. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
     2. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
     3. Storage and Handling Requirements:
        1. Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
        2. Store and protect specified materials from nicks, scratches, and blemishes.
        3. Replace defective or damaged materials with new.
     4. Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

PRODUCTS

* 1. Characters And Lettering
     1. The Sign Fabricator shall be responsible for the quality control of all characters and lettering. All characters shall be crisp, sharp, free of nicks, ragged edges, and discontinuous curves. Letterforms with burrs, saw marks, rounded positive or negative corners, nicked, cut, or ragged edges, etc., will not be accepted. All letterforms shall be so aligned as to maintain a baseline parallel to the sign format unless otherwise indicated in the Design Intent Documents. Margins must be maintained as specified in Design Intent Documents.
     2. All characters and lettering shall conform to approved typeface, weight and letterspacing. No substitutions of typeface foundry, brand or version or implementation technique will be accepted without prior approval.
     3. Cast Characters: Form individual letters and numbers by casting. Produce characters with smooth flat faces, sharp corners, and precisely formed lines and profiles, free from pits, scale, sand holes, and other defects. Cast lugs into back of characters and tap to receive threaded mounting studs.
     4. Cutout Characters: Cut characters from solid plate of thickness and metal indicated. Produce precisely cut characters with square cut, smooth edges.
     5. Fabricated Characters: Fabricate letters and numbers to required sizes and styles, using metals and thickness indicated. Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories.
  2. Illustration, Photography, Imagery, Artwork And Other Graphics
     1. Vinyl Die Cut Graphics: All precision machine-cut vinyl typography or graphics shall be executed in such a manner that all edges and corners of finished letterforms are true and clean. Cut-out characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing. Apply copy to exposed face of panel sign, or glass surfaces. Apply protective, ultraviolet-inhibiting, clear coating to vinyl characters applied to any painted surface. The application of all vinyl characters shall be smooth, free of air bubbles, ridges, creases, distortion, or other imperfections. Application technique must follow manufacturers recommendations. Surface coating shall dry for a minimum 4 days (medium humidity) prior to application of vinyl graphics. Avoid air pockets caused by out-gassing or curing of the base coating upon which self-adhesive vinyl is applied.
     2. Artwork and Imagery: All artwork shall be digitally generated or scanned, high-resolution images. Original images will be provided as original reflective art or digital art at approximately 8" x 10" at 300 dpi. The final production must achieve 100 dpi at full size. Sign Fabricator shall assume scanning, photo retouching and color correction of images is included. Consultant will provide low-resolution file of photo cropping, placement, and color target. Contractor to make final adjustments within high-resolution file. For full color photographic backlit displays, Duratrans or equal shall be used.
     3. Screen Printing: Photo screen printed images shall be sharp without serrated or irregular edges, exactly true to the letter and design form. Screen printed images shall be applied to the base surface within 72 hours of base surface coating application.
  3. Sign Materials
     1. Adhesives: Contact adhesive or foam tape, shall be used in conjunction with silicone adhesives for installation of wall signs, in minimum thicknesses required. Use vertical bands of double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces unless otherwise indicated. Use liquid-silicone adhesive recommended in writing by sign manufacturer to attach signs to irregular, porous, or vinyl covered surfaces. Use double-sided vinyl tape where recommended in writing by sign manufacturer to hold sign in place until adhesive has fully cured.
     2. Metals, General: Standard thickness for all sheet/panel surfaces shall be .125" minimum unless otherwise noted. Contractor shall recommend and use material thickness sufficient to prevent any waviness, "oil canning" or warping of the surface. Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece. When polishing, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
     3. Metals, Aluminum: Aluminum shall be suitable for ornamental, architectural work. Surface finish shall be smooth, free of extrusion marks or imperfections. Alloy shall be selected to meet the structural requirements of the specific application. Aluminum shall not directly contact any other materials. Contact surfaces are to be dielectrically separated with a zinc-chromate coating, bituminous paint, or a gasket.
     4. Metals, Stainless Steel: Stainless steel shall be suitable for ornamental and architectural work. Surface finish shall be smooth, free of all extrusion marks or imperfections. Alloy shall be selected to meet the structural requirements of specific application.
     5. Metals, Structural: Structural metal for concealed framing shall be of galvanized rolled steel or equal as required to satisfy structural requirements.
     6. Acrylic Sheet Plastic: Use Plexiglas II as manufactured by Rohm and Haas Co., or equal. Thickness shall be as indicated on drawings or not less than 1/8" thick. Contractor shall provide color and finish samples of all plastics for approval before fabrication; no substitution in color, thickness, or finish of plastics will be accepted without written approval. All plastics shall be of uniform color, translucence, and illumination, as supplied by manufacturer. Any exposed edges of acrylic shall be finished so as no saw marks are visible. Sheet materials indicated as "clear" shall be supplied as colorless sheet.
     7. Tactile and Braille Copy: Manufacturer's standard process for producing copy must conform to current OBCAccessibility Guidelines. Tactile graphics, lettering and/or Braille must be permanent and chemically fastened in place.
     8. Flexible Sign Face Substrate: All substrate shall be of uniform color, translucence, and thickness, as supplied by manufacturer. Any exposed edges of substrate shall be finished so as no saw marks are visible.
     9. Concrete: Installation of anchoring devices into concrete slab shall be adjusted to avoid penetrating existing reinforcing conduit, etc. contained in the concrete slab.
     10. Decal or Transfer: Printed paper or vinyl suitable for reproducing the design onto material indicated, shall be used as required.
     11. Fasteners: Bolts, nuts, screws, washers, anchors, and other devices required to complete the work. Same basic metal or alloy as the metal fastened and finished to match in color and texture. Stainless steel alloy shall be used to join dissimilar materials. Use of exposed fasteners is prohibited unless otherwise indicated on the design drawings. Use of fasteners, anchors, adhesives, and other attachments shall be in accordance with requirements and recommendations of the manufacturer of the device or material.
     12. Fiberglass Reinforced Polyester (FRP) Construction: Custom engineered one-piece seamless FRP monolith consisting of initial gel coat sealing layer with multilayers of (translucent) thermoset polyester resin and (translucent) glass fiber strands molded in forms maintaining module configuration to 0.125 minimum thickness with 3/16" radius all edges. Core material shall be fully encapsulated resin impregnated honeycomb (expanded foam) as required. All FRP signs shall be finish coated with UV inhibitors and crystal clear matte polyurethane sealers. Sign Fabricator to provide Owner with instructions for maintenance and waxing of FRP signs. In the case of internally illuminated FRP signs, core will be hollow within structural frame to secure FRP molded panels and house illumination fixtures.
     13. Foam Tape: Provide concealed black polyurethane foam tape or "Isotac" laminate tape as manufactured by 3-M (or equal), applied to sign elements as required.
     14. Hardware/Hinges: Provide and install all incidental hardware necessary for the proper functioning of the signs, including but not restricted to materials and products covered in this section. Provide stainless steel hinges for all hinged access panels. Provide pin tumbler locks for all access panels requiring locks.
     15. Insulation: Separate all ferrous and non-ferrous metals with non-conductive gaskets to prevent electrolysis. In addition to gaskets, provide stainless steel fasteners for some cases as required.
     16. PVC Tubing: Provide PVC (polyvinyl chloride/plastic) tubing in thickness and strength suitable for signage as specified. Surfaces should be smooth and clean for application of painted finishes and vinyl graphics. Mount/secure as indicated on drawings (suspended).
     17. Welding Electrodes and Filler Metal: Provide the alloy and type required for strength, workability, compatibility, and color match after grinding smooth and finishing the fabricated product.
     18. Screen Printed Materials: Provide photo processed screening, arranged to furnish sharp and solid images without edge build up or bleeding of the coating. Pattern-cut screens may be used for non-repeat copy, provided that final image copy is equal to photo screen quality. Provide only weather-resistant coating materials, compatible with the intended substrates.
     19. Vinyl Die-Cut And Pattern Cut-Out Graphics: Use pressure-sensitive, non-yellowing, non-peeling and weather resistant vinyls as specified. Use approved fonts and equipment as specified.
     20. Printed Wallcovering: Wallcovering to die cleanly into another inner 90-degree angle surface and tuck under vinyl baseplate or at edge of painted wood baseplate. If the wallcovering edge ends on an outer wall edge, installer to mount edge as securely as possible to reduce the ability of peeling. Wallcovering edges to be aligned to adjoining wallcovering graphic panel and become invisible. Finished wallcovering shall butt and not overlap. Assume all graphics are unique per location unless otherwise notified.
     21. Printed Glass Vinyl Graphics: Edges to be aligned to adjoining vinyl graphic panel and become invisible. Finished vinyl shall butt and not overlap. Assume the printed vinyl is to be optically clear unless otherwise notified in specifications. Assume all graphics are unique per location unless otherwise notified.
  4. Electrical Components
     1. Wiring and Equipment: Provide and install electrical materials such as ballasts, transformers, lamps, sockets, neon units, connectors, and all other equipment. All equipment shall be new and shall be approved by Underwriters Laboratories, Inc. The assembly of all components within the illuminated signs shall conform to current Underwriters Laboratories, Inc. standards. All wiring and equipment shall be concealed within the sign structure unless otherwise instructed.
     2. Transformers: Coordinate location of remote transformers with building construction. Ensure that transformers are accessible after completion of work. Transformers and electrical hardware shall be concealed, non-audible and nonvisible to pedestrian and vehicular traffic in the immediate area of the completed installation. No electrical controls or devices are to be attached to any sign face or support unless required by local authorities having jurisdiction.
     3. Exterior Sign Locations: Electrical components for exterior sign locations shall be suitable for wet location and certified by the manufacturer.
     4. Conduit and Devices: Provide rigid steel conduit, junction boxes and associated devices in accordance with applicable codes as required.
     5. Wiring: Minimum #12 AWG copper. High tension wiring shall not be less than GTO 15 wire as manufactured by Carol Cable company or approved equal. All wiring shall be AWM 90 0 centigrade 1000-volt TW/MTW U.L. file no. 18971. Wiring connectors for wire splicing shall be U.L. approved 1000-volt capacity. They shall be Scotch Lock type Y or R or equal. All splices shall be placed as to easily access for inspection.
     6. Ballasts: As required for internally illuminated cabinet signs, in quantity and arrangement as recommended by ballast manufacturer; accessible for maintenance.
     7. Disconnect Switch: All signs or sign components with electrical service shall be equipped with an approved external disconnect switch, flush mounted on the cabinet/sign, with circuits and capacity to control all primary wiring within the sign. Location of switch must be shown on shop drawings and is subject to approval.
     8. Illumination: All signs with fluorescent fixtures shall utilize minimum 800 miliamp T12 output cool white fluorescent lamps at the length and placement necessary to provide even illumination without light leaks. All lamps and ballasts shall be provided by the Sign Fabricator. Provide waterproof flush access panel(s), concealed wherever possible. Conduit wiring and electrical equipment from the field electrical connection to any part of the sign and within the sign shall be provided by the Sign Fabricator, and Installer shall be a licensed electrician.
  5. Illumination
     1. Internal or External Illumination: Unless otherwise indicated lighting fixture/source must emit a color-balanced, consistent, and uniform light effect with no browning, flickering, haloing, or other uneven effect. No "hot" or "cool" spots will be acceptable. Homogenous illumination is required.
     2. Illuminated Characters: Illuminate characters in manner indicated. Make provisions for servicing and concealing connections to building electrical system. Coordinate electrical characteristics with those of power supply provided.
     3. Ventilation: While maintaining a proper weather seal, provide for sufficient ventilation of sign components to prevent overheating or warpage; allowing for color of sign, mounting surface, climate conditions, etc. In providing for ventilation, protect sign from elements (rain, wind, debris, etc.) that might cause operational or cleaning problems. Signs/cabinets with light leaks will not be accepted.
     4. Neon: Form neon tubing as required, using tubes individually filled at optimum pressure required for uniform lighting. Buttress threaded glass posts, securely attach tubes to supports with pure annealed copper wire ties, without strain on tubing.
  6. finishing materials
     1. Painted surfaces are to be catalyst hardened acrylic polymer using a base clear coat system. Coatings shall not crack, peel, craze, discolor, or fade under ultra-violet light conditions.
     2. Coatings shall be compatible with the surface to which they are applied. Finish applications are to be smooth and uniform, free of "orange-peel" or other irregularities, applied according to manufacturer's recommendations.
     3. Color breaks on sign surfaces shall be sharp, without serration or color bleed or shadows. All drips, splatters and over sprays shall be removed.
     4. Brushed and satin finished aluminum surfaces are to be consistent and uniform among all the signs of the system.
     5. Coatings shall accurately match the colors specified or color swatches furnished by the Designer.
     6. Clear Sealers: Crystal clear matte polyurethane sealers By Matthews Paint Co. or approved equal. Sealers are to resist rust and corrosion associated with exposure to salt air.
     7. Protection: Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
     8. Variations: Variations in appearance of abutting or adjacent pieces are not acceptable. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are not acceptable.
     9. Anodized Aluminum Components/Panels: If required provide anodized (application of aluminum oxide film coating in clear or colored dye finish) aluminum panels or parts to match specified color, grain, finish and specifications.
  7. Fabrication Of Signs and Supports
     1. General: Provide custom manufactured sign assemblies, components completely fabricated and finished at factory before delivery to site. Construct to accurate detail and dimensions as shown in Design Intent Documents and as reviewed on shop drawings. Fit and assemble the work at shop to the greatest extent possible, and mark the components as required to facilitate assembly during installation. Fabricated and assembled materials, prior to painting and finishing shall be free of imperfections, roughness, burrs, open joints, misalignment of components, surface irregularities, pits, piping, or any other substandard feature or condition.
     2. Seams and Joints: Added joints shall be ground, filled and finished flush and smooth with adjacent work. Such seams shall be invisible after final finish has been applied. Spot welded joints shall not be visible on exterior of signs after final finish has been applied. No gaps, light leaks, waves, or oil canning will be permitted in work.
     3. Metal Signs and Supports: Fabricate exposed surfaces uniformly flat and smooth, without distortion, pitting or other blemishes. Form exposed metal edges to a smooth radius. Permanently bond the laminated metal components and honeycomb core with adhesive or sealant in accordance with product manufacturer's recommendations. Grind exposed welds and rough areas to make flush with adjacent smooth surfaces.
     4. Castings: Exposed surfaces shall be uniformly free from porosity, roughness, pits, sand holes, and other defects. Edges are to be filled and ground smooth. Faces chemically etched and mechanically polished for specified finish. Castings shall be of alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated. Concealed studs will be used unless otherwise indicated.
     5. Galvanizing: Provide for steel components in exterior construction and where noted to be galvanized. Complete the shop fabrication prior to application of the zinc coating. Remove mill scale and rust, clean and pickle the units as required for proper pretreatment of the surfaces.
     6. Hardware: Provide all incidental hardware necessary for the proper functioning of signs. External hardware shall conform to the external appearance of the sign.
     7. Support, Backing and Blocking: Sign Fabricator shall provide engineered sign supports anchored to building structure where required and to meet requirements of applicable building codes. Support or backing requiring installation within the building wall construction shall be immediately relayed to the Owner for field coordination. Furnish templates for installation of anchorage devices.
  8. Shop Application Of Sign Finishes
     1. Sign Graphics: Provide the letters, numerals, symbols, and other graphics markings, using the finish materials shown. Apply the graphics neatly, uniformly proportioned and spaced, and accurate within the dimensions indicated. Prepare the substrate surfaces and apply finish materials in accordance with manufacturers' instructions.
     2. Metal Finishes: Remove scratches, abrasions, dents and other blemishes before applying finish. Apply relevant finishes to the fabricated work, with texture and reflectivity as specified in Design Intent Documents.
     3. Linear Polyurethane Finishes: Clean the surfaces as required for proper adhesion of coatings. Use cleanser and water, and/or chemically treat as recommended by paint manufacturer to remove deleterious film or residue. Provide pretreatment and primer in accordance with manufacturer's recommendation.
  9. Graphic Application
     1. Preparation: Surfaces to receive the graphic markings shall be clean, dry, and otherwise made ready for application of the materials. Accurately measure and lay out the required marking configurations as indicated on drawings.
     2. Vinyl Die-cut and Pattern-cut Graphics: Use die cut, pressure sensitive, non-yellowing, non-peeling and weather resistant vinyl adhesive letters or images, custom flood coated as required. Apply in strict accordance with manufacturer's instructions. Make uniformly smooth and free from bubbles, wrinkles, stretching and blemishes.
     3. Painted or Screen-Printed Graphics: All graphics to be applied using photo processed screens from camera ready art, arranged to furnish sharp and solid images without build-up or bleeding of the coating. Comply with coating manufacturer's application instructions. Provide proper type of primer to suit each substrate and obtain a permanent bond. Verify compatibility of each substrate with the coatings to be used in the work. Apply the markings with neat edges, minimum thickness and as required to obtain solid markings without voids.
     4. Acid-Etched Graphics and Typography: Acid-etched typography and graphic imagery must be clean, crisp, sharp edges; ragged or soft (polished out) edges will be rejected. Acid baths used for etching should be fresh and used in an environment and temperature that will provide the highest quality etched images. Infill with color as indicated by Design Intent Documents. Maintain ink fills true to the edges of letterforms/graphics. Etch to depth indicated in Design Intent Documents.

execution

* 1. general requirements for execution
     1. Protection: Protect the work during the construction period so that it will be without any indication of use or damage. Leave the work clean and free from defects at time of acceptance.
     2. Final Walk-Through and Punchlist: Final walk-through will be held with Consultant and Owner to review the finished installation. A punch-list of all items requiring modification will be developed and issued. Consultant and Owner reserve the right to reject all or part of a sign that does not correspond to the Design Intent Documents, specifications, or the approved shop drawings. Sign Fabricator shall promptly conduct repair and completion of all items for final acceptance by the Owner.
     3. Guarantee: Sign Fabricator to provide full guarantee of all workmanship, materials, equipment, etc. of this installation for a period of one (1) year after final acceptance. Sign Fabricator shall replace/repair any defective work within thirty (30) days after notification by Owner throughout the duration of this period.
     4. Fabrication Errors: If the Sign Fabricator has made an error in copy (message), color, material, quality, etc. these items must be corrected within thirty (30) days of observation of error (at no additional cost). Sign Fabricator will be notified with a written punch-list as errors are discovered.
     5. Erection of Signs: Set and attach the work accurately in location, alignment, and elevation, plumb, level, and true, as measured from established reference points and from other work already in place. Fit components accurately together to form tight joints and secure connections. Coordinate, with the Consultant, and other trades and make connections of illuminated signs to electrical service. Exterior wall penetrations and blocking are to be coordinated immediately upon award of contract. Test illuminated sign components and adjusted operation for proper performance.
     6. Illuminated Signs: Burn-in all illuminated signs for a period of 100 hours prior to delivery to the job site.
     7. Adjusting: Neatly repair minor blemishes or marring on finished surfaces so that repairs are imperceptible. Completely replace components having permanent non-removable scratches, stains, or other defacement.
  2. examination
     1. Verification of Conditions: Sign Fabricator must examine the areas to receive the work and the conditions under which the work will be performed. Prior to commencing work, verify that items, including anchor inserts, and electrical power provided are sized and located to accommodate work. Sign Fabricator shall remedy conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.
     2. Pre-Installation Meeting: A pre-installation meeting will be held with Consultant, Contractor, and Owner to mutually agree on all installation details, placement, etc.
  3. installation
     1. General: Complete installation shall be in accordance with manufacturers' printed instructions and accepted shop drawings and best industry practice. Sign Fabricator will be responsible for daily clean up of their areas of work. Locate signs and accessories as indicated in Design Intent Document, using mounting methods of types described and in compliance with manufacturer's written instructions and best industry practice. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
     2. Shim Plate Mounting: Provide concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach signs to shim plate using mechanical fasteners or adhesives as indicated in Design Intent Documents. Where shim plate is exposed, provide a decorative cover as required.
     3. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer, engineer, or best industry practice.
     4. Bracket-Mounted Units: Provide custom brackets, fittings, and hardware as appropriate for mounting signs that project at right angles from walls and ceilings. Attach brackets and fittings securely to walls and ceilings with concealed fasteners and anchoring devices to comply with manufacturer's written instructions, engineer, or best industry practice.
     5. Dimensional Characters: Mount characters using standard fastening methods, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
     6. Cast-Metal Plaques: Mount plaques using standard fastening methods recommended in writing by manufacturer for type of wall surface indicated.
     7. Illuminated Characters: Run wires into wall construction through conduit. Use insulators as necessary.
     8. For neon lighting wiring. Exposed-to-view wiring or conduit on wall face is not permitted unless otherwise indicated.
  4. CLEANING
     1. Provide required information in accordance with Section 01 74 00 - Cleaning. Upon completion of the work, remove unused materials, debris, containers, and equipment from the project site. Remove protective coverings and clean the exposed surfaces of the Work to remove dirt, stains, and other substances, by methods as recommended by manufacturer.
     2. Removal of materials and devices that protect installed work at the time of substantial performance as agreed in advance with the Owner.
     3. After installation, clean soiled sign surfaces. Protect signs from damage until acceptance by Owner.
     4. Remove protective coating or materials from signs and from the job site when required.
     5. Touch up all fasteners or finished surfaces scratched or blemished during installation.

end of section